



033072-026.ST25

SEQUENCE LISTING

<110> Oakley, Robert H.
Sarak, Lawrence S.
Laporte, Stephane A.
Caron, Marc G.

<120> Modified G-Protein Coupled Receptors

<130> 033072-026

<140> US 09/993,844

<151> 2001-11-05

<150> US 60/245,772

<151> 2000-11-03

<150> US 60/260,363

<151> 2001-01-08

<160> 81

<170> FastSEQ for Windows Version 4.0

<210> 1

<211> 371

<212> PRT

<213> Artificial Sequence

<220>

<221> amino acid sequence of wild-type V2R

<400> 1

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Pro	Ser	Leu	Pro	Ser	Asn	Ser	Ser	Gln	Glu	Arg	Pro	Leu	Asp	Thr	Arg
			20					25					30		
Asp	Pro	Leu	Ala	Arg	Ala	Glu	Leu	Ala	Leu	Leu	Ser	Ile	Val	Phe	
		35				40					45				
Val	Ala	Val	Ala	Leu	Ser	Asn	Gly	Leu	Val	Leu	Ala	Ala	Leu	Ala	Arg
	50					55					60				
Arg	Gly	Arg	Arg	Gly	His	Trp	Ala	Pro	Ile	His	Val	Phe	Ile	Gly	His
65					70				75					80	
Leu	Cys	Leu	Ala	Asp	Leu	Ala	Val	Ala	Leu	Phe	Gln	Val	Leu	Pro	Gln
			85					90					95		
Leu	Ala	Trp	Lys	Ala	Thr	Asp	Arg	Phe	Arg	Gly	Pro	Asp	Ala	Leu	Cys
			100					105					110		
Arg	Ala	Val	Lys	Tyr	Leu	Gln	Met	Val	Gly	Met	Tyr	Ala	Ser	Ser	Tyr
		115					120					125			
Met	Ile	Leu	Ala	Met	Thr	Leu	Asp	Arg	His	Arg	Ala	Ile	Cys	Arg	Pro
		130				135						140			
Met	Leu	Ala	Tyr	Arg	His	Gly	Ser	Gly	Ala	His	Trp	Asn	Arg	Ile	Val
		145			150				155					160	
Leu	Val	Ala	Trp	Ala	Phe	Ser	Leu	Leu	Leu	Ser	Leu	Ile	Gln	Leu	Phe
			165					170					175		

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Ile Phe Ala Gln Arg Asn Val Glu Gly Gly Ser Gly Val Thr Asp Cys
 180 185 190
 Trp Ala Cys Phe Ala Glu Pro Trp Gly Arg Arg Thr Tyr Val Thr Trp
 195 200 205
 Ile Ala Leu Met Val Phe Val Ala Pro Thr Leu Gly Ile Ala Ala Cys
 210 215 220
 Gln Val Leu Ile Phe Arg Glu Ile His Ala Ser Leu Val Pro Gly Pro
 225 230 235 240
 Ser Glu Arg Pro Gly Gly Arg Arg Arg Gly Arg Arg Thr Gly Ser Pro
 245 250 255
 Gly Glu Gly Ala His Val Ser Ala Ala Val Ala Lys Thr Val Arg Met
 260 265 270
 Thr Leu Val Ile Val Val Val Tyr Val Leu Cys Trp Ala Pro Phe Phe
 275 280 285
 Leu Val Gln Leu Trp Ala Ala Trp Asp Pro Glu Ala Pro Leu Glu Gly
 290 295 300
 Ala Pro Phe Val Leu Leu Met Leu Leu Ala Ser Leu Asn Ser Cys Thr
 305 310 315 320
 Asn Pro Trp Ile Tyr Ala Ser Phe Ser Ser Ser Val Ser Ser Glu Leu
 325 330 335
 Arg Ser Leu Leu Cys Cys Ala Arg Gly Arg Thr Pro Pro Ser Leu Gly
 340 345 350
 Pro Gln Asp Glu Ser Cys Thr Thr Ala Ser Ser Ser Leu Ala Lys Asp
 355 360 365
 Thr Ser Ser
 370

*C10> 2

*C11> 413

*C12> PRT

*C13> Artificial Sequence

*C20>

*C23> Amino acid sequence of wild-type beta2AR

*C400> 1

Met Gly Gln Pro Gly Asn Gly Ser Ala Phe Leu Leu Ala Pro Asn Arg
 1 5 10 15
 Ser His Ala Pro Asp His Asp Val Thr Gln Gln Arg Asp Glu Val Trp
 20 25 30
 Val Val Gly Met Gly Ile Val Met Ser Leu Ile Val Leu Ala Ile Val
 35 40 45
 Phe Gly Asn Val Leu Val Ile Thr Ala Ile Ala Lys Phe Glu Arg Leu
 50 55 60
 Gln Thr Val Thr Asn Tyr Phe Ile Thr Ser Leu Ala Cys Ala Asp Leu
 65 70 75 80
 Val Met Gly Leu Ala Val Val Pro Phe Gly Ala Ala His Ile Leu Met
 85 90 95
 Lys Met Trp Thr Phe Gly Asn Phe Trp Cys Glu Phe Trp Thr Ser Ile
 100 105 110
 Asp Val Leu Cys Val Thr Ala Ser Ile Glu Thr Leu Cys Val Ile Ala
 115 120 125
 Val Asp Arg Tyr Phe Ala Ile Thr Ser Pro Phe Lys Tyr Gln Ser Leu
 130 135 140
 Leu Thr Lys Asn Lys Ala Arg Val Ile Ile Leu Met Val Trp Ile Val
 145 150 155 160

Ser Gly Leu Thr Ser Phe Leu Pro Ile Gln Met His Trp Tyr Arg Ala
 165 170 175
 Thr His Gln Glu Ala Ile Asn Cys Tyr Ala Asn Glu Thr Cys Cys Asp
 180 185 190
 Phe Phe Thr Asn Gln Ala Tyr Ala Ile Ala Ser Ser Ile Val Ser Phe
 195 200 205
 Tyr Val Pro Leu Val Ile Met Val Phe Val Tyr Ser Arg Val Phe Gln
 210 215 220
 Glu Ala Lys Arg Gln Leu Gln Lys Ile Asp Lys Ser Glu Gly Arg Phe
 225 230 235 240
 His Val Gln Asn Leu Ser Gln Val Glu Gln Asp Gly Arg Thr Gly His
 245 250 255
 Gly Leu Arg Arg Ser Ser Lys Phe Cys Leu Lys Glu His Lys Ala Leu
 260 265 270
 Lys Thr Leu Gly Ile Ile Met Gly Thr Phe Thr Leu Cys Trp Leu Pro
 275 280 285
 Phe Phe Ile Val Asn Ile Val His Val Ile Gln Asp Asn Leu Ile Arg
 290 295 300
 Lys Glu Val Tyr Ile Leu Leu Asn Trp Ile Gly Tyr Val Asn Ser Gly
 305 310 315 320
 Phe Asn Pro Leu Ile Tyr Cys Arg Ser Pro Asp Phe Arg Ile Ala Phe
 325 330 335
 Gln Glu Leu Leu Cys Leu Arg Arg Ser Ser Leu Lys Ala Tyr Gly Asn
 340 345 350
 Gly Tyr Ser Ser Asn Gly Asn Thr Gly Glu Gln Ser Gly Tyr His Val
 355 360 365
 Glu Gln Glu Lys Glu Asn Lys Leu Leu Cys Glu Asp Leu Pro Gly Thr
 370 375 380
 Glu Asp Phe Val Gly His Gln Gly Thr Val Pro Ser Asp Asn Ile Asp
 385 390 395 400
 Ser Gln Gly Arg Asn Cys Ser Thr Asn Asp Ser Leu Leu
 405 410

-110- 3

-111- 370

-112- FRT

-113- Artificial Sequence

-120-

-123- amino acid sequence of beta2-AR-V2R chimera

-100- 3

Met Gly Gln Pro Gly Asn Gly Ser Ala Ile Leu Leu Ala Pro Asn Arg
 1 5 10 15
 Ser His Ala Pro Asp His Asp Val Thr Gln Gln Arg Asp Gln Val Trp
 20 25 30
 Val Val Gly Met Gly Ile Val Met Ser Leu Ile Val Leu Ala Ile Val
 35 40 45
 Phe Gly Asn Val Leu Val Ile Thr Ala Ile Ala Lys Phe Glu Asn Leu
 50 55 60
 Gln Thr Val Thr Asn Tyr Ile Ile Thr Ser Leu Ala Cys Ala Asp Leu
 65 70 75 80
 Val Met Gly Leu Ala Val Val Pro Phe Gly Ala Ala His Ile Leu Met
 85 90 95
 Lys Met Trp Thr Phe Gly Asn Phe Thr Cys Gln Phe Thr Thr Ser Ile
 100 105 110

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Asp Val Leu Cys Val Thr Ala Ser Ile Glu Thr Leu Cys Val Ile Ala
   115                               120               125
Val Asp Arg Tyr Phe Ala Ile Thr Ser Pro Phe Lys Tyr Gln Ser Leu
   130                               135               140
Leu Thr Lys Asn Lys Ala Arg Val Ile Ile Leu Met Val Trp Ile Val
   145                               150               155               160
Ser Gly Leu Thr Ser Phe Leu Pro Ile Gln Met His Trp Tyr Arg Ala
   165                               170               175
Thr His Gln Glu Ala Ile Asn Cys Tyr Ala Asn Glu Thr Cys Cys Asp
   180                               185               190
Phe Phe Thr Asn Gln Ala Tyr Ala Ile Ala Ser Ser Ile Val Ser Phe
   195                               200               205
Tyr Val Pro Leu Val Ile Met Val Phe Val Tyr Ser Arg Val Phe Gln
   210                               215               220
Glu Ala Lys Arg Gln Leu Gln Lys Ile Asp Lys Ser Glu Gly Arg Phe
   225                               230               235               240
His Val Gln Asn Leu Ser Gln Val Glu Gln Asp Gly Arg Thr Gly His
   245                               250               255
Gly Leu Arg Arg Ser Ser Lys Phe Cys Leu Lys Glu His Lys Ala Leu
   260                               265               270
Lys Thr Leu Gly Ile Ile Met Gly Thr Phe Thr Leu Cys Trp Leu Pro
   275                               280               285
Phe Phe Ile Val Asn Ile Val His Val Ile Gln Asp Asn Leu Ile Arg
   290                               295               300
Lys Glu Val Tyr Ile Leu Leu Asn Trp Ile Gly Tyr Val Asn Ser Gly
   305                               310               315               320
Phe Asn Pro Leu Ile Tyr Cys Arg Ser Pro Asp Phe Arg Ile Ala Phe
   325                               330               335
Gln Glu Leu Leu Cys Ala Arg Gly Arg Thr Pro Pro Ser Leu Gly Pro
   340                               345               350
Gln Asp Glu Ser Cys Thr Thr Ala Ser Ser Ser Leu Ala Lys Asp Thr
   355                               360               365
Ser Ser
   370

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<210> 4

<211> 382

<212> PRT

<213> Artificial Sequence

<210>

<223> amino acid sequence of MCR-MER chimera expressed
from the pEARrB-1/MCR vector

<400> 4

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Leu Ala Gln Ala Ser Cys Ser Pro Ala Pro Gly Ser Trp Leu Asn Leu
   20                               25               30
Ser His Val Asp Gly Asn Gln Ser Asp Pro Cys Gly Leu Asn Arg Thr
   35                               40               45
Gly Leu Gly Gly Asn Asp Ser Leu Cys Pro Gln Thr Gly Ser Pro Ser
   50                               55               60
Met Val Thr Ala Ile Thr Ile Met Ala Leu Tyr Ser Ile Val Cys Val
   65                               70               75
Val Gly Leu Phe Gly Asn Phe Leu Val Thr Tyr Val Ile Val Asn Tyr

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			35					90				95			
Thr	Lys	Met	Lys	Thr	Ala	Thr	Asn	Ile	Tyr	Ile	Phe	Asn	Leu	Ala	Leu
			100					105					110		
Ala	Asp	Ala	Leu	Ala	Thr	Ser	Thr	Leu	Pro	Phe	Gln	Ser	Val	Asn	Tyr
			115					120					125		
Leu	Met	Gly	Thr	Trp	Pro	Phe	Gly	Thr	Ile	Leu	Cys	Lys	Ile	Val	Ile
			130				135				140				
Ser	Ile	Asp	Tyr	Tyr	Asn	Met	Phe	Thr	Ser	Ile	Phe	Thr	Leu	Cys	Thr
			145			150				155					160
Met	Ser	Val	Asp	Arg	Tyr	Ile	Ala	Val	Cys	His	Pro	Val	Lys	Ala	Leu
			165					170						175	
Asp	Phe	Arg	Thr	Pro	Arg	Asn	Ala	Lys	Ile	Val	Asn	Val	Cys	Asn	Trp
			180					185					190		
Ile	Leu	Ser	Ser	Ala	Ile	Gly	Leu	Pro	Val	Met	Phe	Met	Ala	Thr	Thr
			195				200					205			
Lys	Tyr	Arg	Gln	Gly	Ser	Ile	Asp	Cys	Thr	Leu	Thr	Phe	Ser	His	Pro
			210			215					220				
Thr	Trp	Tyr	Trp	Glu	Asn	Leu	Leu	Lys	Ile	Cys	Val	Phe	Ile	Phe	Ala
			225		230					235					240
Phe	Ile	Met	Pro	Ile	Leu	Ile	Ile	Thr	Val	Cys	Tyr	Gly	Leu	Met	Ile
			245					250						255	
Leu	Arg	Leu	Lys	Ser	Val	Arg	Met	Leu	Ser	Gly	Ser	Lys	Gln	Lys	Asp
			260				265						270		
Arg	Asn	Leu	Arg	Arg	Ile	Thr	Arg	Met	Val	Leu	Val	Val	Val	Ala	Val
			275				280						285		
Phe	Ile	Val	Cys	Trp	Thr	Pro	Ile	His	Ile	Tyr	Val	Ile	Ile	Lys	Ala
			290			295					300				
Leu	Ile	Thr	Ile	Pro	Glu	Thr	Thr	Phe	Gln	Thr	Val	Ser	Trp	His	Phe
			305		310					315					320
Cys	Ile	Ala	Leu	Gly	Tyr	Thr	Asn	Ser	Cys	Leu	Asn	Pro	Val	Leu	Tyr
			325					330						335	
Ala	Phe	Leu	Asp	Glu	Asn	Phe	Lys	Arg	Cys	Phe	Arg	Glu	Phe	Cys	Ala
			340				345						350		
Ala	Ala	Arg	Gly	Arg	Thr	Pro	Pro	Ser	Leu	Gly	Pro	Gln	Asp	Gln	Ser
			355			360						365			
Cys	Thr	Thr	Ala	Ser	Ser	Ser	Leu	Ala	Lys	Asp	Thr	Ser	Ser		
			370			375					380				

02100-5

02110-382

0212-ERT

0213-Artificial Sequence

0220-

0223- amino acid sequence of ELAB-GLP chimera expressed from the pEARrB-1-ELAB vector

0400-5

Met	Ala	Pro	Asn	Thr	Ser	Thr	Met	Asp	Glu	Ala	Gly	Leu	Pro	Ala	Glu
1				5				10						15	
Arg	Asp	Phe	Ser	Phe	Arg	Ile	Leu	Thr	Ala	Cys	Phe	Leu	Ser	Leu	Leu
			20					25					30		
Ile	Leu	Ser	Thr	Leu	Leu	Gly	Asn	Thr	Leu	Val	Cys	Ala	Ala	Val	Ile
			35			40						45			
Arg	Phe	Arg	His	Leu	Arg	Ser	Lys	Val	Thr	Asn	Ile	Phe	Val	Ile	Ser
			50			55					60				

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Leu Ala Val Ser Asp Leu Leu Val Ala Val Leu Val Met Pro Trp Lys
65          70          75          80
Ala Val Ala Glu Ile Ala Gly Phe Trp Pro Phe Gly Ser Phe Cys Asn
          85          90          95
Ile Trp Val Ala Phe Asp Ile Met Cys Ser Thr Ala Val Ile Leu Asn
100        105        110
Leu Cys Val Ile Ser Val Asp Arg Tyr Trp Ala Ile Ser Ser Pro Phe
115        120        125
Gln Tyr Glu Arg Lys Met Thr Pro Lys Ala Ala Phe Ile Leu Ile Ser
130        135        140
Val Ala Trp Thr Leu Ser Val Leu Ile Ser Phe Ile Pro Val Gln Leu
145        150        155        160
Ser Trp His Lys Ala Lys Pro Thr Trp Pro Leu Asp Gly Asn Phe Thr
165        170        175
Ser Leu Glu Asp Thr Glu Asp Asp Asn Cys Asp Thr Arg Leu Ser Arg
180        185        190
Thr Tyr Ala Ile Ser Ser Ser Leu Ile Ser Phe Tyr Ile Pro Val Ala
195        200        205
Ile Met Ile Val Thr Tyr Thr Ser Ile Tyr Arg Ile Ala Gln Lys Gln
210        215        220
Ile Arg Arg Ile Ser Ala Leu Glu Arg Ala Ala Val His Ala Lys Asn
225        230        235        240
Cys Gln Thr Thr Ala Gly Asn Gly Asn Pro Val Glu Cys Ala Gln Ser
245        250        255
Glu Ser Ser Phe Lys Met Ser Phe Lys Arg Glu Thr Lys Val Leu Lys
260        265        270
Thr Leu Ser Val Ile Met Gly Val Phe Val Cys Cys Trp Leu Pro Phe
275        280        285
Phe Ile Ser Asn Cys Met Val Pro Phe Cys Gly Ser Glu Glu Thr Gln
290        295        300
Pro Phe Cys Ile Asp Ser Ile Thr Phe Asp Val Phe Val Trp Phe Gly
305        310        315        320
Trp Ala Asn Ser Ser Leu Asn Pro Ile Ile Tyr Ala Phe Asn Ala Asp
325        330        335
Phe Gln Lys Ala Phe Ser Thr Leu Leu Gly Cys Tyr Arg Leu Cys Ala
340        345        350
Ala Ala Arg Gly Arg Thr Pro Pro Ser Leu Gly Pro Gln Asp Gln Ser
355        360        365
Cys Thr Thr Ala Ser Ser Ser Leu Ala Lys Asp Thr Ser Ser
370        375        380

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<210> 6

<211> 451

<212> PRT

<213> Artificial Sequence

<220>

<223> amino acid sequence of 5HT1AR-V2R chimera
expressed from the pEArrB-1/5HT1AR vector

<400> 6

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Met Asp Val Leu Ser Pro Gly Gln Gly Asn Asn Thr Thr Ser Pro Pro
1          10
Ala Pro Phe Ala Thr Gly Gly Asn Thr Thr Gly Ile Ser Asp Val Thr
25        35
Val Ser Tyr Gln Val Ile Thr Ser Leu Leu Leu Gly Thr Leu Ile Phe

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35	40	45
Cys Ala Val Leu Gly Asn Ala Cys Val Val Ala Ala Ile Ala Leu Glu		
50	55	60
Arg Ser Leu Gln Asn Val Ala Asn Tyr Leu Ile Gly Ser Leu Ala Val		
65	70	75
Thr Asp Leu Met Val Ser Val Leu Val Leu Pro Met Ala Ala Leu Tyr		
85	90	95
Gln Val Leu Asn Lys Trp Thr Leu Gly Gln Val Thr Cys Asp Leu Phe		
100	105	110
Ile Ala Leu Asp Val Leu Cys Cys Thr Ser Ser Ile Leu His Leu Cys		
115	120	125
Ala Ile Ala Leu Asp Arg Tyr Trp Ala Ile Thr Asp Pro Ile Asp Tyr		
130	135	140
Val Asn Lys Arg Thr Pro Arg Arg Ala Ala Ala Leu Ile Ser Leu Thr		
145	150	155
Trp Leu Ile Gly Phe Leu Ile Ser Ile Pro Pro Met Leu Gly Trp Arg		
160	165	170
Thr Pro Glu Asp Arg Ser Asp Pro Asp Ala Cys Thr Ile Ser Lys Asp		
180	185	190
His Gly Tyr Thr Ile Tyr Ser Thr Phe Gly Ala Phe Tyr Ile Pro Leu		
195	200	205
Leu Leu Met Leu Val Leu Tyr Gly Arg Ile Phe Arg Ala Ala Arg Phe		
210	215	220
Arg Ile Arg Lys Thr Val Lys Lys Val Glu Lys Thr Gly Ala Asp Thr		
225	230	235
Arg His Gly Ala Ser Pro Ala Pro Gln Pro Lys Lys Ser Val Asn Gly		
240	245	250
Glu Ser Gly Ser Arg Asn Trp Arg Leu Gly Val Glu Ser Lys Ala Gly		
260	265	270
Gly Ala Leu Cys Ala Asn Gly Ala Val Arg Gln Gly Asp Asp Gly Ala		
275	280	285
Ala Leu Glu Val Ile Glu Val His Arg Val Gly Asn Ser Lys Glu His		
290	295	300
Leu Pro Leu Pro Ser Glu Ala Gly Pro Thr Pro Cys Ala Pro Ala Ser		
305	310	315
Phe Glu Arg Lys Asn Glu Arg Asn Ala Gln Ala Lys Arg Lys Met Ala		
320	325	330
Leu Ala Arg Gln Phe Lys Thr Val Lys Thr Leu Gly Ile Ile Met Gly		
335	340	345
Thr Phe Ile Leu Cys Trp Leu Pro Phe Phe Ile Val Ala Leu Val Leu		
350	355	360
Pro Phe Cys Gln Ser Ser Cys His Met Pro Thr Leu Leu Gly Ala Ile		
365	370	375
Ile Asn Trp Leu Gly Tyr Ser Asn Ser Leu Leu Asn Pro Val Ile Tyr		
380	385	390
Ala Tyr Phe Asn Lys Asp Phe Gln Asn Ala Phe Lys Lys Ile Ile Lys		
400	405	410
Cys Asn Phe Cys Ala Ala Ala Arg Gly Arg Thr Pro Pro Ser Leu Gly		
420	425	430
Pro Gln Asp Glu Ser Cys Thr Thr Ala Ser Ser Ser Leu Ala Lys Asp		
435	440	445
Thr Ser Ser		
450		

<211> 7
<211> 194

<212> PRT
<213> Artificial Sequence

<220>

<223> amino acid sequence of beta3AR-V2R chimera
expressed from pEARrB-1/beta3AR vector

<400> 7

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Leu Pro Thr Leu Ala Pro Asn Thr Ala Asn Thr Ser Gly Leu Pro Gly
      20              25              30
Val Pro Trp Glu Ala Ala Leu Ala Gly Ala Leu Leu Ala Leu Ala Val
      35              40              45
Leu Ala Thr Val Gly Gly Asn Leu Leu Val Ile Val Ala Ile Ala Trp
      50              55              60
Thr Pro Arg Leu Gln Thr Met Thr Asn Val Phe Val Thr Ser Leu Ala
      65              70              75              80
Ala Ala Asp Leu Val Met Gly Leu Leu Val Val Pro Pro Ala Ala Thr
      85              90              95
Leu Ala Leu Thr Gly His Trp Pro Leu Gly Ala Thr Gly Cys Glu Leu
      100             105             110
Trp Thr Ser Val Asp Val Leu Cys Val Thr Ala Ser Ile Glu Thr Leu
      115             120             125
Cys Ala Leu Ala Val Asp Arg Tyr Leu Ala Val Thr Asn Pro Leu Arg
      130             135             140
Tyr Gly Ala Leu Val Thr Lys Arg Cys Ala Arg Thr Ala Val Val Leu
      145             150             155             160
Val Trp Val Val Ser Ala Ala Val Ser Phe Ala Pro Ile Met Ser Gln
      165             170             175
Trp Trp Arg Val Gly Ala Asp Ala Glu Ala Gln Arg Cys His Ser Asn
      180             185             190
Pro Arg Cys Cys Ala Phe Ala Ser Asn Met Pro Tyr Val Leu Leu Ser
      195             200             205
Ser Ser Val Ser Phe Tyr Leu Pro Leu Leu Val Met Leu Phe Val Tyr
      210             215             220
Ala Arg Val Phe Val Val Ala Thr Arg Gln Leu Arg Leu Leu Arg Gly
      225             230             235             240
Gln Leu Gly Arg Phe Pro Pro Glu Glu Ser Pro Pro Ala Pro Ser Arg
      245             250             255
Ser Leu Ala Pro Ala Pro Val Gly Thr Cys Ala Pro Pro Glu Gly Val
      260             265             270
Pro Ala Cys Gly Arg Arg Pro Ala Arg Leu Leu Pro Leu Arg Ala Ala
      275             280             285
Arg Ala Leu Cys Thr Leu Gly Leu Ile Met Gly Thr Phe Thr Leu Cys
      290             295             300
Trp Leu Pro Phe Phe Leu Ala Asn Val Leu Arg Ala Leu Gly Gly Pro
      305             310             315             320
Ser Leu Val Pro Gly Pro Ala Phe Leu Ala Leu Asn Trp Leu Gly Tyr
      325             330             335
Ala Asn Ser Ala Phe Asn Pro Leu Ile Tyr Cys Arg Ser Pro Asp Phe
      340             345             350
Arg Ser Ala Phe Arg Arg Leu Leu Cys Arg Cys Ala Ala Ala Arg Gly
      355             360             365
Arg Thr Pro Leu Ser Leu Gly Pro Gln Asp Glu Ser Cys Thr Thr Ala
      370             375             380
Ser Ser Ser Leu Ala Lys Asp Thr Ser Ser

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385

390

-0210- 8

-0211- 362

-0212- PRT

-0213- Artificial Sequence

-0220-

-0223- amino acid sequence of Edg1R-V2R chimera expressed
from pEArrB-1/Edg1R vector

-4000- 8

Met	Gly	Pro	Thr	Ser	Val	Pro	Leu	Val	Lys	Ala	His	Arg	Ser	Ser	Val	1	5	10	15
Ser	Asp	Tyr	Val	Asn	Tyr	Asp	Ile	Ile	Val	Arg	His	Tyr	Asn	Tyr	Thr	20	25	30	
Gly	Lys	Leu	Asn	Ile	Ser	Ala	Asp	Lys	Glu	Asn	Ser	Ile	Lys	Leu	Thr	35	40	45	
Ser	Val	Val	Phe	Ile	Leu	Ile	Cys	Cys	Phe	Ile	Ile	Leu	Glu	Asn	Ile	50	55	60	
Phe	Val	Leu	Leu	Thr	Ile	Trp	Lys	Thr	Lys	Lys	Phe	His	Arg	Pro	Met	65	70	75	80
Tyr	Tyr	Phe	Ile	Gly	Asn	Leu	Ala	Leu	Ser	Asp	Leu	Leu	Ala	Gly	Val	85	90	95	
Ala	Tyr	Thr	Ala	Asn	Leu	Leu	Leu	Ser	Gly	Ala	Thr	Thr	Tyr	Lys	Leu	100	105	110	
Thr	Pro	Ala	Gln	Trp	Phe	Leu	Arg	Glu	Gly	Ser	Met	Phe	Val	Ala	Leu	115	120	125	
Ser	Ala	Ser	Val	Phe	Ser	Leu	Leu	Ala	Ile	Ala	Ile	Glu	Arg	Tyr	Ile	130	135	140	
Thr	Met	Leu	Lys	Met	Lys	Leu	His	Asn	Gly	Ser	Asn	Asn	Phe	Arg	Leu	145	150	155	160
Phe	Leu	Leu	Ile	Ser	Ala	Cys	Trp	Val	Ile	Ser	Leu	Ile	Leu	Gly	Gly	165	170	175	
Leu	Pro	Ile	Met	Gly	Trp	Asn	Cys	Ile	Ser	Ala	Leu	Ser	Ser	Cys	Ser	180	185	190	
Thr	Val	Leu	Pro	Leu	Tyr	His	Lys	His	Tyr	Ile	Leu	Phe	Cys	Thr	Thr	195	200	205	
Val	Phe	Thr	Leu	Leu	Leu	Leu	Ser	Ile	Val	Ile	Leu	Tyr	Cys	Arg	Ile	210	215	220	
Tyr	Ser	Leu	Val	Arg	Thr	Arg	Ser	Arg	Arg	Leu	Thr	Phe	Arg	Lys	Asn	225	230	235	240
Ile	Ser	Lys	Ala	Ser	Arg	Ser	Ser	Glu	Lys	Ser	Leu	Ala	Leu	Leu	Lys	245	250	255	
Thr	Val	Ile	Ile	Val	Leu	Ser	Val	Phe	Ile	Ala	Cys	Trp	Ala	Pro	Leu	260	265	270	
Phe	Ile	Leu	Leu	Leu	Leu	Asp	Val	Gly	Cys	Lys	Val	Lys	Thr	Cys	Asp	275	280	285	
Ile	Leu	Phe	Arg	Ala	Glu	Tyr	Phe	Leu	Val	Leu	Ala	Val	Leu	Asn	Ser	290	295	300	
Gly	Thr	Asn	Pro	Ile	Ile	Tyr	Thr	Leu	Thr	Asn	Lys	Glu	Met	Arg	Arg	305	310	315	320
Ala	Phe	Ile	Arg	Ile	Met	Ser	Cys	Cys	Lys	Cys	Ala	Ala	Ala	Arg	Gly	325	330	335	
Arg	Thr	Pro	Pro	Ser	Leu	Gly	Pro	Gln	Asp	Glu	Ser	Cys	Thr	Thr	Ala	340	345	350	

Ser Ser Ser Leu Ala Lys Asp Thr Ser Ser
355 360

<210> 9

<211> 1113

<212> DNA

<213> Artificial Sequence

<220>

<223> nucleotide sequence of beta2AR-V2R chimera

<400> 9

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tcttcgagcg tcttcgagcg aagggagggg gctggggggt tgggcaggg : tatcgtcag 120
tcttcgagcg tcttcgagcg cgtggtttgg aatgtgtgtg tcttcgagcg : tcttcgagcg 180
tcttcgagcg tcttcgagcg cagggccttc ttgctgggac ccaatagaa : tatggcgcg 240
gctggggggt tgggcagggg gctggggggt gctggggggt tgggcaggg : tatcgtcag 300
tcttcgagcg tcttcgagcg gctggggggt gctggggggt tgggcaggg : tatcgtcag 360
tcttcgagcg tcttcgagcg gctggggggt gctggggggt tgggcaggg : tatcgtcag 420
tcttcgagcg tcttcgagcg gctggggggt gctggggggt tgggcaggg : tatcgtcag 480
tcttcgagcg tcttcgagcg gctggggggt gctggggggt tgggcaggg : tatcgtcag 540
tcttcgagcg tcttcgagcg gctggggggt gctggggggt tgggcaggg : tatcgtcag 600
tcttcgagcg tcttcgagcg gctggggggt gctggggggt tgggcaggg : tatcgtcag 660
tcttcgagcg tcttcgagcg gctggggggt gctggggggt tgggcaggg : tatcgtcag 720
tcttcgagcg tcttcgagcg gctggggggt gctggggggt tgggcaggg : tatcgtcag 780
tcttcgagcg tcttcgagcg gctggggggt gctggggggt tgggcaggg : tatcgtcag 840
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tcttcgagcg tcttcgagcg gctggggggt gctggggggt tgggcaggg : tatcgtcag 960
tcttcgagcg tcttcgagcg gctggggggt gctggggggt tgggcaggg : tatcgtcag 1020
tcttcgagcg tcttcgagcg gctggggggt gctggggggt tgggcaggg : tatcgtcag 1080
tcttcgagcg tcttcgagcg gctggggggt gctggggggt tgggcaggg : tatcgtcag 1140
tcttcgagcg tcttcgagcg gctggggggt gctggggggt tgggcaggg : tatcgtcag 1200

```

<211> 10

<212> 1149

<213> DNA

<214> Artificial Sequence

<220>

<223> nucleotide sequence of MOR-V2R chimera

<400> 10

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atgggagaga tcttcgagcg aagggagggg agggaggggt tgggcaggg : tatcgtcag 60
tcttcgagcg tcttcgagcg aagggagggg agggaggggt tgggcaggg : tatcgtcag 120
tcttcgagcg tcttcgagcg aagggagggg agggaggggt tgggcaggg : tatcgtcag 180
tcttcgagcg tcttcgagcg aagggagggg agggaggggt tgggcaggg : tatcgtcag 240
tcttcgagcg tcttcgagcg aagggagggg agggaggggt tgggcaggg : tatcgtcag 300
tcttcgagcg tcttcgagcg aagggagggg agggaggggt tgggcaggg : tatcgtcag 360
tcttcgagcg tcttcgagcg aagggagggg agggaggggt tgggcaggg : tatcgtcag 420
tcttcgagcg tcttcgagcg aagggagggg agggaggggt tgggcaggg : tatcgtcag 480
tcttcgagcg tcttcgagcg aagggagggg agggaggggt tgggcaggg : tatcgtcag 540
tcttcgagcg tcttcgagcg aagggagggg agggaggggt tgggcaggg : tatcgtcag 600
tcttcgagcg tcttcgagcg aagggagggg agggaggggt tgggcaggg : tatcgtcag 660
tcttcgagcg tcttcgagcg aagggagggg agggaggggt tgggcaggg : tatcgtcag 720
tcttcgagcg tcttcgagcg aagggagggg agggaggggt tgggcaggg : tatcgtcag 780
tcttcgagcg tcttcgagcg aagggagggg agggaggggt tgggcaggg : tatcgtcag 840
tcttcgagcg tcttcgagcg aagggagggg agggaggggt tgggcaggg : tatcgtcag 900
tcttcgagcg tcttcgagcg aagggagggg agggaggggt tgggcaggg : tatcgtcag 960
tcttcgagcg tcttcgagcg aagggagggg agggaggggt tgggcaggg : tatcgtcag 1020
tcttcgagcg tcttcgagcg aagggagggg agggaggggt tgggcaggg : tatcgtcag 1080
tcttcgagcg tcttcgagcg aagggagggg agggaggggt tgggcaggg : tatcgtcag 1140
tcttcgagcg tcttcgagcg aagggagggg agggaggggt tgggcaggg : tatcgtcag 1200

```

```

atcatcaaaag cgotgatcac gattccagaa accacatttc agaccgtttc ctjgcacttc 960
tgcattgctt tgggttacac gaacagctgc ctgaatccag ttctttacgc ctccctggat 1020
gaaaacttca agcagtgctt cagagagttc tggcgggcgc cagggggaag caccaccacc 1080
agctgggttc cccaagatca gtctgcacc accgcagct cctccctggc caaygacact 1140
tcctgtga                                     1149

```

Q110: 11

Q111: 1143

Q112: DNA

Q113: Artificial Sequence

Q120:

Q123: nucleotide sequence of D1AR-V2R chimera

Q400: 11

```

atggttccta acacttcctc catggatgag gccgggctgc cagcggagag ggatttcctc 60
ttctgcctcc tcacggcctg ttctctgtca ctgtccctcc tgtccactct cctgggcaat 120
acctttgtct gtgcggcctg cctccggttt cgaacactga ggtccaaagt gaccaaactc 180
tttgtcactc ctttagctgt gtcagatctc ttggtggctg tcttggctat ggcctggaaa 240
gttgtggcgc agattgtctg cttttggccc ttgggtctct ttgttaacat ctgggttagc 300
tttgacatca tgtgtctcac ggcgtccatt ctgaacctct ggtgatccag cgtggacagg 360
tactgggcta tctccagccc ttccagctat gagggaaga tgacccccc aaagcagcttc 420
ctcttgatta gctgagcatg gactctgtct gtccctatat cctccatccc agtacagcta 480
agctggcaca aggcacagcc caccatggcc ttgcatggca atttacctc cctggaggac 540
atcgaggatg acaactgtga cacaaggctg agcaggagct atgcaccttc atcgtccctc 600
atcagctttt acatccctgt agccattatg atcgtccact acacacgtat ctacaggatt 660
gcccagaagt aaacccgggc atctcagctc tggagagggc agcagtcacat gccaaagaatt 720
gcacagccac ccgaggtaac gggaaacccc tccaatgggc ccagtcctgaa agttccttta 780
agatgtctct caagayggag acgaaagttc caagagcgt gtctgtgac cgtgggggtg 840
tttgtgtctg ctggtctcct ctttccatct cgaactgtat ggtgcccctc tgtggtctg 900
aggagaccca ggcattctgc atcagattca tcaccttcca tgtgtttgtg tggtttgggt 960
gggcgaatcc cccctgaa cccattatct atgttttaa tggcgacttc cagaaggcgt 1020
tttcaacccc cttaggatgc tacagactct ggcgggcgc acggggagcc accccaccca 1080
gctgggtccc ccaagatgag tctgcacca ccgcagctc cctccctggc aagggaactt 1140
tcctgtga                                     1149

```

Q110: 12

Q111: 1356

Q112: DNA

Q113: Artificial Sequence

Q120:

Q123: nucleotide sequence of BHT1AR-V2R chimera

Q400: 12

```

atgcatgtgc tcagccctgg tcagggcacc aacaccacat caccacccgc tccctttgag 60
accggcgcca acactaactg tatctccgac gtgaccccca gctaccaagt gatcacctct 120
ctgtgtctgg gacgctcat cttctggcgc gtgtgggcca atgcgtgcgt ggtggtgccc 180
atggtcttgg agcgtccctc gacgaacgtg gcccaattat ttattggctc ttggcggttc 240
accgaactca tgggtgtcgt gttggtgtgt cccatggcgc cgtgtatcca ggtgtcaac 300
aagtggacac tgggcaggtt aacctggcac ctgttccatg cctccagctt cttgtgtgct 360
acctcatcca tcttgacct gtgcgcctac ggcctggaca ggtactggg ctatcagggc 420
cccctcagct acgtgaacaa gaggacgccc cggcgcgccg ctgcgtccat ctgtgtccat 480
tggcttattg gcttctcat ctctatcccg cccatgtctg gctggcgcan cccggagagc 540
cgctcggacc ccgacgcctg caccattagc aaggatcatg gctacactat ctatttccac 600
tttgagctt tctacatccc gctgctgctc atgctggctt tctatggcgc catattccga 660
gctgcgcgct tccgcatccg caagaaggct aaaaaggctg agaagacgg aggggacacc 720

```

```

cgccatggag catctccgcg ccgagagccc aagaagagtg tgaatggaga gtcgggggagc 780
aggactctgga ggtctgggggt ggagagcaag gctgggggtg ctctgtgggc caatggggcg 840
gtgaggcaag gtgacgatgg ccgcggccctg gaggtgatcg aggtgcaccg agtggggcaac 900
tcbaaagagc acctgcctct gccagcgag gctgntctca ccccttgtgc ccccgccctct 960
ttcgagagga aaaat-gagcg caacgcggag gcgaagggca agatggccct ggcccgagag 1020
aggagagacg tgaagacgct ggcatcctc atgggcaact tcatctctg ctgggtgcgc 1080
ctctcctcgt tggctcttgc ctgccccttc tgcgagagca gttgccacat gttccacctg 1140
ttggggcgca taatcaattg gctggggtac tcaactctc tgettaaccc cgtcatttac 1200
gcatacttca acagggaact tcaaaaacgg ttaagaaga tcattaagtg taacttctgc 1260
ggggcgccac ggggagccac cccaccagc ctgggtcccc aagatgagtc ctgcaccacc 1320
ggaggtctct cctgggcca ggacacttca tctga 1356

```

4219 - 13

4211 - 1185

4212 - DNA

4213 - Artificial Sequence

4220 -

4221 - nucleotide sequence of beta3-AR-V2R chimera

4400 - 13

```

atgggtccgt ggctcagga gaacagctct ctggcccctt ggccggcaact tccaccctg 60
tcgcccataa ccgcccacac cagtggggtg ccagggggtt cgtgggagga ggcctagcc 120
ggggccctgc tggcgctggc ggtgctggc acgctgggag gcaacctgct gttcctctg 180
ggcatcgctt ggaactccag actccagacc atgacccaac tgttcgtgac ttgggtggcc 240
gcagccgacc tgggtgatgg actcctgggt gtgcccgcgg cggccacctt ggccgtgact 300
ggccactggc cgttgggggc cactgggtgc gagctgtgga cctcgggtga cgtgctgtgt 360
gtgacgggca gcctcgaaa cctgtgcggc ctgggpcgtg accgctacct ggtgtgacc 420
aaccccgctg gttacgggc actggtcacc aagcgctgc ccgggacagc tgtggtcctg 480
gtgtgggtcg tctgggcgc ggtgtcgttt ggcggcatca tgagccagtg gtggcgcgta 540
ggggcgagcg ccgaggcgca gcgctgcac tccaaacccg cgtgctgtgc ctccgcctcc 600
aacatgcctt acgtgctgct gtctcctcc gtctcctct accttctct tctcgtgatg 660
ctcttcgtct acgcgcggtt tctcgtggtg gctacgggca agctgcgctt gctggcgggg 720
gagtgaggac gcttccgccc agaggagctt ccgcccggc cgtcggctt tctggccctg 780
gctcgggtgg ggaactgggc tccggccgaa ggggtgccc cctcggggcg gctggccggc 840
aggtcctgct ctctccggga acacggggc ctgtgcacct tgggtctcat ctggggcacc 900
ttcactctct gctgggttgc cttctttctg gccaacgtgc tgcgcgcctt ggggggcccc 960
tctctagtc cggggccggc ttctcttgc ctgaactggc taggttatgc caattctgac 1020
ttcaccgccc tcatctactg ccgcagcccg gaattctgca ggccttccg caattctctg 1080
tctctctg cggccaccg gggagggacc ccaaccagcc tgggtcccca caattctctg 1140
tcggcccccg ccagctctct cctgggccaag gacacttcat cctga 1185

```

4211 - 14

4211 - 1089

4212 - DNA

4213 - Artificial Sequence

4220 -

4221 - nucleotide sequence of Edg1-V2R chimera

4400 - 14

```

atggggccca ccagggtccc gctggtcaag gctccacgca gctcggctct taattagctc 60
aaatatgata tcatctctcg gattataaac taacggggaa agctgaatat taagcgggac 120
aaagcaaaaa gcttctcctt gactctggtg gtttctctta tcatctgctg atttctcttc 180
ctgggcaaaa tcttctctt gttgactatt tggaaaacaa agaatctcca cctcccatg 240
taattattta tcttctctt ggactctca gacttctggt agagagtagc ctatccagat 300
aaattctctt tcttctctt gactctctac gactctctt agagagtagc gtttctggtg 360

```

```

gaagggaagta tgtttgtgga cctgtcagcc tccgtgttca gtctctctgc cctcgcatt 420
gagcgctata tcacaatgct gaaaatgaaa ctccacaacg ggagcaataa ctcccgctc 430
ttcttgctaa tcagcgctg ctgggtcctc tccctcctcc tgggtggcct gctatcatg 540
ggctggaaat gcctcagtcg cctgttcagc tgcctcagc tgcctgcctg ctaccacaag 600
cactatctcc tctctgcac cagcgtcttc actctgcttc tgcctcctat cgtcattctg 660
tactgcagaa tctactcttc ggtcaggact cggagcagcc gctgacgtt cgtcagaagc 720
atttcgaagg ccagcgcagc ctctgagaag tgcctggcgc tgcctcagac cgttaatttc 780
gtctgcagcg tcttcctcgc ctgctgggca cagctcttca tctctctctt gctggatgtg 840
ggctgcaagg tgaagacctg tgacatcttc ttcagagcgc agtacttctt ggtgttagct 900
gtctcgaact ccggcaccac ccccatcatt taccctctga ccaacaagga gatgcgtcgg 960
gcttcctctc ggatcctgtc ctgctgcaag tgcctggcgc cagggggagc caccctaccc 1020
agctgggttc cccaagatga gtctgcacc accgcagct cctccttgcg caaggacact 1080
tcctgtga                                     1089

```

<210> 15

<211> 43

<212> PRT

<213> Homo sapiens

<400> 15

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Asn Pro Ile Val Tyr Ala Phe Arg Ile Gln Lys Phe Arg Val Thr Phe
 1             5             10             15
Leu Lys Ile Trp Asn Asp His Phe Arg Cys Gln Pro Ala Pro Pro Ile
 20             25             30
Asp Glu Asp Leu Pro Glu Glu Arg Pro Asp Asp
 35             40

```

<210> 16

<211> 176

<212> PRT

<213> Homo sapiens

<400> 16

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Asn Pro Ile Ile Tyr Pro Cys Ser Ser Lys Glu Phe Arg Ala Phe Val
 1             5             10             15
Arg Ile Leu Gly Cys Gln Cys Arg Gly Arg Gly Arg Arg Arg Arg
 20             25             30
Arg Arg Arg Arg Leu Gly Gly Cys Ala Tyr Thr Tyr Arg Pro Trp Thr
 35             40             45
Arg Gly Gly Ser Leu Glu Arg Ser Gln Ser Arg Lys Asp Ser Leu Asp
 50             55             60
Asp Ser Gly Ser Cys Leu Ser Gly Ser Gln Arg Thr Leu Pro Ser Ala
 65             70             75             80
Ser Pro Ser Pro Gly Tyr Leu Gly Arg Gly Ala Pro Pro Pro Val Glu
 85             90             95
Leu Lys Ala Phe Pro Glu Trp Lys Ala Pro Gly Ala Leu Leu Ser Leu
100             105             110
Pro Ala Pro Glu Pro Pro Gly Arg Arg Gly Arg His Asp Ser Gly Pro
115             120             125
Leu Phe Thr Phe Lys Leu Leu Thr Glu Pro Glu Ser Pro Gly Thr Asp
130             135             140
Gly Gly Ala Ser Asn Gly Gly Cys Glu Ala Ala Ala Asp Val Ala Asn
145             150             155             160
Gly Gln Pro Gly Phe Lys Ser Asn Met Pro Leu Ala Pro Gly Gln Phe
165             170             175

```

02100 17
02110 29
02120 PRT
02130 Homo sapiens

04000 17
Asn Pro Val Ile Tyr Thr Ile Phe Asn His Asp Phe Arg Arg Ala Phe
1 5 10 15
Lys Lys Ile Leu Cys Arg Gly Asp Arg Lys Arg Ile Val
20 25

02100 18
02110 29
02120 PRT
02130 Human

04000 18
Asn Pro Val Ile Tyr Thr Ile Phe Asn Gln Asp Phe Arg Arg Ala Phe
1 10 15
Arg Arg Ile Leu Cys Arg Pro Trp Thr Gln Thr Ala Trp
20 25

02100 19
02110 31
02120 PRT
02130 Human

04000 19
Asn Pro Val Ile Tyr Thr Val Phe Asn Gln Asp Phe Arg Pro Ser Phe
1 10 15
Lys His Ile Leu Phe Arg Arg Arg Arg Arg Arg Gly Phe Arg Gln
20 25 30

02100 20
02110 105
02120 PRT
02130 Homo sapiens

04000 20
Asn Pro Ile Ile Tyr Cys Arg Ser Pro Asp Phe Arg Lys Ala Ile Gln
1 10 15
Gly Leu Leu Cys Cys Ala Arg Arg Ala Ala Arg Arg Arg His Ala Thr
20 25 30
His Gly Asp Arg Pro Arg Ala Ser Gly Cys Leu Ala Arg Pro Gly Pro
35 40 45
Pro Pro Ser Pro Gly Ala Ala Ser Asp Asp Asp Asp Asp Asp Val Val
50 55 60
Gly Ala Thr Pro Pro Ala Arg Leu Leu Glu Pro Trp Ala Gly Cys Asn
65 70 75 80
Gly Gly Ala Ala Ala Asp Ser Asp Ser Ser Leu Asp Glu Pro Cys Arg
85 90 95
Pro Gly Phe Ala Ser Ala Ser Lys Val
100 105

0210> 21
 0211> 42
 0212> PRT
 0213> Homo sapiens

0400> 21
 Asn Pro Leu Ile Tyr Cys Arg Ser Pro Asp Phe Arg Ile Ala Phe Gln
 1 5 10 15
 Glu Leu Leu Cys Leu Arg Arg Ser Ser Leu Lys Ala Tyr Gly Asn Gly
 20 25 30
 Tyr Ser Ser Asn Gly Asn Thr Gly Glu Gln Ser Gly Tyr His Val Glu
 35 40 45
 Gln Glu Lys Glu Asn Lys Leu Leu Cys Glu Asp Leu Pro Gly Thr Glu
 50 55 60
 Asp Phe Val Gly His Gln Gly Thr Val Pro Ser Asp Asn Ile Asp Ser
 65 70 75 80
 Gln Gly Arg Asn Cys Ser Thr Asn Asp Ser Leu Leu
 85 90

0210> 12
 0211> 120
 0212> PRT
 0213> Homo sapiens

0400> 12
 Asn Pro Ile Ile Tyr Ala Phe Asn Ala Asp Phe Arg Lys Ala Phe Ser
 1 5 10 15
 Thr Leu Leu Gly Cys Tyr Arg Leu Cys Pro Ala Thr Asn Asn Ala Ile
 20 25 30
 Glu Thr Val Ser Ile Asn Asn Asn Gly Ala Ala Met Phe Ser Ser His
 35 40 45
 His Glu Pro Arg Gly Ser Ile Ser Lys Glu Cys Asn Leu Val Tyr Leu
 50 55 60
 Ile Pro His Ala Val Gly Ser Ser Glu Asp Leu Lys Lys Glu Glu Ala
 65 70 75 80
 Ala Gly Ile Ala Arg Pro Leu Glu Lys Leu Ser Pro Ala Leu Ser Val
 85 90 95
 Ile Leu Asp Tyr Asp Thr Asp Val Ser Leu Glu Lys Ile Gln Pro Ile
 100 105 110
 Thr Glu Asn Gly Glu His Pro Thr
 115 120

0210> 23
 0211> 22
 0212> PRT
 0213> Human

0400> 23
 Asn Pro Ile Ile Tyr Thr Thr Phe Asn Ile Glu Phe Arg Lys Ala Phe
 1 5 10 15
 Leu Lys Ile Leu His Cys
 20

<210> 24
 <211> 22
 <212> PRT
 <213> Human

<400> 24
 Asn Pro Val Ile Tyr Thr Thr Phe Asn Ile Glu Phe Arg Lys Ala Phe
 1 5 10 15
 Leu Lys Ile Leu Ser Cys
 20

<210> 15
 <211> 14
 <212> PRT
 <213> Human

<400> 15
 Asn Pro Val Ile Tyr Thr Val Phe Asn Ala Glu Phe Arg Asn Val Phe
 1 5 10 15
 Arg Lys Ala Leu Arg Ala Cys Cys
 20

<210> 16
 <211> 123
 <212> PRT
 <213> Human

<400> 16
 Asn Pro Val Ile Tyr Ala Phe Asn Ala Asp Phe Gln Lys Val Phe Ala
 1 5 10 15
 Gln Leu Leu Gly Cys Ser His Phe Cys Ser Arg Thr Pro Val Glu Thr
 20 25 30
 Val Asn Ile Ser Asn Glu Leu Ile Ser Tyr Asn Gln Asp Ile Val Phe
 35 40 45
 His Lys Glu Ile Ala Ala Ala Tyr Ile His Met Met Pro Asn Ala Val
 50 55 60
 Thr Pro Gly Asn Arg Glu Val Asp Asn Asp Glu Glu Gly Pro Phe
 65 70 75 80
 Asp Arg Met Phe Gln Ile Tyr Gln Thr Ser Pro Asp Gly Asp Ile Val
 85 90
 Ala Glu Ser Val Trp Glu Leu Asp Cys Glu Gly Glu Ile Ser Leu Asn
 95 100 105 110
 Lys Ile Thr Pro Phe Thr Pro Asn Gly Phe His
 115 120

<210> 27
 <211> 47
 <212> PRT
 <213> Homo sapiens

<400> 27
 Asn Pro Met Lys Tyr Ala Ile Tyr Asn Lys Ala Phe Arg Asp Thr Phe
 1 5 10 15

Arg Leu Leu Leu Leu Cys Arg Trp Asp Lys Arg Arg Trp Arg Lys Ile
 20 25 30
 Pro Lys Arg Pro Gly Ser Val His Arg Thr Pro Ser Arg Gln Cys
 35 40 45

<210> 28
 <211> 31
 <212> FRT
 <213> Homo sapiens

<400> 28
 Asn Pro Ala Cys Tyr Ala Leu Cys Asn Ala Thr Phe Lys Lys Thr Phe
 5 10 15
 Lys His Leu Leu Met Cys His Tyr Lys Asn Ile Gly Ala Thr Arg
 20 25 30

<210> 29
 <211> 31
 <212> FRT
 <213> Homo sapiens

<400> 29
 Asn Pro Val Cys Tyr Ala Leu Cys Asn Lys Thr Phe Arg Thr Thr Phe
 5 10 15
 Lys Met Leu Leu Leu Cys Gln Cys Asp Lys Lys Lys Arg Arg Lys Gln
 20 25 30
 Gln Tyr Gln Gln Arg Gln Ser Val Ile Phe His Lys Arg Ala Pro Glu
 35 40 45
 Gln Ala Leu
 50

<210> 30
 <211> 31
 <212> FRT
 <213> Homo sapiens

<400> 30
 Asn Pro Ala Cys Tyr Ala Leu Cys Asn Ala Thr Phe Lys Lys Thr Phe
 5 10 15
 Arg His Leu Leu Leu Cys His Tyr Arg Asn Ile Gly Thr Ala Arg
 20 25 30

<210> 31
 <211> 42
 <212> FRT
 <213> Artificial Sequence

<220>
 <223> m5 muscarinic receptor

<400> 41
 Asn Pro Ile Cys Tyr Ala Leu Cys Asn Arg Thr Phe Arg Lys Thr Ile
 5 10 15

Lys Met Leu Leu Leu Cys Arg Trp Lys Lys Lys Lys Val Glu Glu Lys
 20 25 30
 Leu Tyr Trp Gln Gly Asn Ser Lys Leu Pro
 35 40

<210> 32
 <211> 34
 <212> PRT
 <213> Homo sapiens

<400> 32
 Asn Pro Val Ile Tyr Ala Tyr Phe Asn Lys Asp Phe Gln Asn Ala Phe
 1 5 10 15
 Lys Lys Ile Ile Lys Lys Lys Phe
 20

<210> 33
 <211> 36
 <212> PRT
 <213> Homo sapiens

<400> 33
 Asn Pro Ile Ile Tyr Thr Met Ser Asn Glu Asp Phe Lys Glu Ala Phe
 1 5 10 15
 His Lys Leu Ile Arg Phe Lys Cys Thr Ser
 20 25

<210> 34
 <211> 34
 <212> PRT
 <213> Homo sapiens

<400> 34
 Asn Pro Leu Leu Tyr Thr Ser Phe Asn Glu Asp Phe Lys Leu Ala Phe
 1 5 10 15
 Lys Lys Leu Ile Arg Cys Arg Glu
 20

<210> 35
 <211> 37
 <212> PRT
 <213> Artificial Sequence

<210>
 <213> Olfactory receptor 6A1

<400> 35
 Asn Pro Ile Ile Tyr Cys Leu Arg Asn Glu Glu Val Lys Arg Ala Leu
 1 5 10 15
 Lys Cys Ile Leu His Leu Tyr Glu His Glu Asp Phe Asp Pro Lys Lys
 20 25
 Gly Ser Arg Asn Val

<210> 36
 <211> 27
 <212> FRT
 <213> Artificial Sequence

<220>
 <223> olfactory receptor 2C1

<400> 36
 Asn Pro Leu Ile Tyr Thr Leu Arg Asn Met Glu Val Lys Gly Ala Leu
 1 5 10 15
 Arg Arg Leu Leu Gly Lys Gly Arg Glu Val Gly
 20 25

<210> 37
 <211> 62
 <212> FRT
 <213> Homo sapiens

<400> 37
 Asn Pro Leu Phe Tyr Gly Phe Leu Gly Lys Lys Phe Lys Arg Tyr Phe
 1 5 10 15
 Leu Gln Leu Leu Lys Tyr Ile Pro Pro Lys Ala Lys Ser His Ser Asn
 20 25 30
 Leu Ser Thr Lys Met Ser Thr Leu Ser Tyr Arg Pro Ser Asp Asn Val
 35 40 45
 Ser Ser Ser Thr Lys Lys Pro Ala Pro Cys Phe Glu Val Glu
 50 55 60

<210> 38
 <211> 60
 <212> FRT
 <213> Homo sapiens

<400> 38
 Asn Pro Phe Leu Tyr Cys Phe Val Gly Asn Arg Phe Gln Gln Lys Leu
 1 5 10 15
 Arg Ser Val Phe Arg Val Pro Ile Thr Trp Leu Gln Gly Lys Arg Glu
 20 25 30
 Ser Met Ser Tyr Arg Lys Leu Ser Ser Ser Arg Glu Met Ile Thr Ile
 35 40 45
 Val Ser
 50

<210> 39
 <211> 61
 <212> FRT
 <213> Homo sapiens

<400> 39
 Asn Pro Leu Ile Tyr Ala Phe Ile Gly Gln Lys Phe Arg His Gly Leu
 1 5 10 15

Leu Lys Ile Leu Ala Ile His Gly Leu Ile Ser Lys Asp Ser Leu Pro
 20 25 30
 Lys Asp Ser Arg Pro Ser Phe Val Gly Ser Ser Ser Gly His Thr Ser
 35 40 45
 Thr Thr Leu
 50

0010: 40
 0011: 67
 0012: PRT
 0013: Artificial Sequence

0020:
 0021: cx3c chemokine receptor 1 (cx3cr1) (fractalkine
 receptor

0030: 40
 Asn Pro Leu Ile Tyr Ala Phe Ala Gly Glu Lys Phe Arg Arg Tyr Leu
 1 5 10 15
 Tyr His Leu Tyr Gly Lys Cys Leu Ala Val Leu Cys Gly Arg Ser Val
 20 25 30
 His Val Asp Phe Ser Ser Ser Glu Ser Gln Arg Ser Arg His Gly Ser
 35 40 45
 Val Leu Ser Ser Asn Phe Thr Tyr His Thr Ser Asp Gly Asp Ala Leu
 50 55 60
 Leu Leu Leu
 65

0010: 41
 0011: 59
 0012: PRT
 0013: Human

0000: 41
 Asn Pro Ile Leu Tyr Asn Leu Val Ser Ala Asn Phe Arg His Ile Phe
 1 5 10 15
 Leu Ala Thr Leu Ala Cys Leu Cys Pro Val Trp Arg Arg Arg Arg Lys
 20 25 30
 Arg Pro Ala Phe Ser Arg Lys Ala Asp Ser Val Ser Ser Asn His Thr
 35 40 45
 Leu Ser Ser Asn Ala Thr Arg Glu Thr Leu Tyr
 50 55

0010: 42
 0011: 107
 0012: PRT
 0013: Artificial Sequence

0020:
 0021: substance-P receptor (SPR) (NK-1 receptor) (NK-1R)

0030: 42
 Asn Pro Ile Ile Tyr Tyr Tyr Leu Asn Arg Arg Phe Arg Leu Tyr Phe
 1 5 10 15

Lys His Ala Phe Arg Cys Cys Pro Phe Ile Ser Ala Gly Asp Tyr Glu
 20 25 30
 Gly Leu Glu Met Lys Ser Thr Arg Tyr Leu Gln Thr Gln Gly Ser Val
 35 40 45
 Tyr Lys Val Ser Arg Leu Glu Thr Thr Ile Ser Thr Val Val Gly Ala
 50 55 60
 His Glu Glu Glu Pro Glu Asp Gly Pro Lys Ala Thr Pro Ser Ser Leu
 65 70 75 80
 Asp Leu Thr Ser Asn Cys Ser Ser Arg Ser Asp Ser Lys Thr Met Thr
 85 90 95
 Glu Ser Phe Ser Phe Ser Ser Asn Val Leu Ser
 100 105

<110> 43
 <111> 60
 <112> PBT
 <113> Homo sapiens

<400> 43
 Asn Pro Trp Ile Tyr Ala Ser Phe Ser Ser Val Ser Ser Glu Leu Arg
 5 10 15
 Ser Leu Leu Cys Cys Ala Arg Gly Arg Thr Pro Pro Ser Leu Gly Pro
 20 25 30
 Gln Asp Glu Ser Cys Thr Thr Ala Ser Ser Ser Leu Ala Lys Asp Thr
 35 40 45
 Ser Ser
 50

<110> 44
 <111> 83
 <112> PBT
 <113> Human

<400> 44
 Asn Pro Val Ile Tyr Asn Leu Met Ser Gln Lys Phe Arg Ala Ala Phe
 5 10 15
 Arg Lys Leu Cys Asn Cys Lys Gln Lys Pro Thr Glu Lys Pro Ala Asn
 20 25 30
 Tyr Ser Val Ala Leu Asn Tyr Ser Val Ile Lys Glu Ser Asp His Phe
 35 40 45
 Ser Thr Glu Leu Asp Asp Ile Thr Val Thr Asp Thr Tyr Leu Ser Ala
 50 55 60
 Thr Lys Val Ser Phe Asn Arg Thr Tyr Leu Ala Ser Gln Val Ser Leu
 65 70 75 80
 Ser Gln Ser

<110> 45
 <111> 65
 <112> PBT
 <113> Human

<400> 45
 Asn Pro Trp Ile Tyr Met Leu Phe Thr Gly His Leu Phe His His Leu

1	5	10	15
Val Gln Arg Phe Leu Cys Cys Ser Ala Ser Tyr Leu Lys Gly Arg Arg			
	20	25	30
Leu Gly Glu Thr Ser Ala Ser Lys Lys Ser Asn Ser Ser Ser Phe Val			
	35	40	45
Leu Ser His Arg Ser Ser Ser Gln Arg Ser Cys Ser Gln Pro Ser Thr			
	50	55	60
Ala			
65			

<210> 46
 <211> 75
 <212> PBT
 <213> Homo sapiens

1	5	10	15
Asn Pro Val Leu Tyr Ser Leu Met Ser Ser Arg Phe Arg Gln Thr Phe			
	20	25	30
Gln Glu Ala Leu Cys Leu Gly Ala Cys Cys His Arg Leu Arg Pro Arg			
	35	40	45
His Ser Ser His Ser Leu Ser Arg Met Thr Thr Gly Ser Thr Leu Cys			
	50	55	60
Asp Val Gly Ser Leu Gly Ser Trp Val His Pro Leu Ala Gly Asn Asp			
	65	70	75
Gly Pro Glu Ala Gln Gln Glu Thr Asp Pro Ser			

<210> 47
 <211> 62
 <212> PBT
 <213> Homo sapiens

1	5	10	15
Asn Pro Leu Val Tyr Cys Phe Met His Arg Arg Phe Arg Gln Ala Cys			
	20	25	30
Leu Glu Thr Cys Ala Arg Cys Cys Pro Arg Pro Pro Arg Ala Arg Pro			
	35	40	45
Arg Ala Leu Pro Asp Glu Asp Pro Pro Thr Pro Ser Ile Ala Ser Leu			
	50	55	60
Pro Arg Leu Ser Tyr Thr Thr Thr Ser Thr Leu Gly Pro Gly			

<210> 48
 <211> 82
 <212> PBT
 <213> Homo sapiens

1	5	10	15
Asn Pro Leu Val Tyr Ala Leu Ala Ser Arg His Phe Arg Ala Arg Phe			
	20	25	30
Arg Arg Leu Tyr Pro Cys Gly Arg Arg Arg Arg His Arg Ala Arg Arg			
	35	40	45
Ala Leu Arg Arg Val Arg Pro Ala Ser Ser Gly Pro Pro Gly Tyr Pro			
	50	55	60

Gly Asp Ala Arg Pro Ser Gly Arg Leu Leu Ala Gly Gly Gly Gln Gly
 50 55 60
 Pro Glu Pro Arg Glu Gly Pro Val His Gly Gly Glu Ala Ala Arg Gly
 65 70 75 80
 Pro Glu

0210- 49
 0211- 76
 0212- PBT
 0213- Human

0400- 49
 Asn Pro Ile Ile Tyr Thr Leu Thr Asn Lys Glu Met Arg Arg Ala Phe
 1 5 10 15
 Ile Arg Ile Met Ser Cys Cys Lys Cys Pro Ser Gly Asp Ser Ala Gly
 20 25 30
 Lys Phe Lys Arg Pro Ile Ile Ala Gly Met Glu Phe Ser Arg Ser Lys
 35 40 45
 Ser Asp Asn Ser Ser His Pro Gln Lys Asp Glu Gly Asp Asn Pro Glu
 50 55 60
 Thr Ile Met Ser Ser Gly Asn Val Asn Ser Ser Ser
 65 70 75

0210- 50
 0211- 80
 0212- PFT
 0213- Homo sapiens

0400- 50
 Asn Pro Ile Ile Tyr Ala Leu Arg Ser Lys Asp Leu Arg His Ala Phe
 1 5 10 15
 Arg Ser Met Phe Pro Ser Cys Glu Gly Thr Ala Gln Pro Leu Asp Asn
 20 25 30
 Ser Met Gly Asp Ser Asp Cys Leu His Lys His Ala Asn Asn Ala Ala
 35 40 45
 Ser Val His Arg Ala Ala Glu Ser Cys Ile Lys Ser Thr Val Lys Ile
 50 55 60
 Ala Lys Val Thr Met Ser Val Ser Thr Asp Thr Ser Ala Glu Ala Leu
 65 70 75 80

0210- 51
 0211- 59
 0212- PBT
 0213- Human

0400- 51
 Asn Pro Val Leu Tyr Ala Phe Leu Asp Glu Asn Phe Lys Arg Tyr Phe
 1 5 10 15
 Arg Gln Leu Cys Arg Lys Pro Cys Gly Arg Pro Asp Pro Ser Ser Phe
 20 25 30
 Ser Arg Pro Arg Glu Ala Thr Ala Arg Ala Arg Val Thr Ala Tyr Thr
 35 40 45
 Pro Ser Asp Gly Pro Gly Gly Gly Arg Ala Ala

50

55

0210- 52
0211- 58
0212- FRT
0213- Human

0400- 52
Asp Pro Phe Val Tyr Tyr Phe Val Ser His Asp Phe Arg Asp His Ala
1 5 10 15
Lys Asn Ala Leu Leu Cys Arg Ser Val Arg Thr Val Lys Gln Met Gln
20 25 30
Val Ser Leu Thr Ser Lys Lys His Ser Arg Lys Ser Ser Ser Tyr Ser
35 40 45
Ser Ser Ser Thr Thr Val Lys Thr Ser Tyr
50

0210- 53
0211- 66
0212- FRT
0213- Rat

0400- 53
Asn Gly Glu Val Gln Ala Glu Leu Arg Arg Lys Trp Arg Arg Trp His
1 5 10 15
Leu Gln Gly Val Leu Gly Trp Ser Ser Lys Ser Gln His Pro Trp Gly
20 25 30
Gly Ser Asn Gly Ala Thr Cys Ser Thr Gln Val Ser Met Leu Thr Arg
35 40 45
Val Ser Pro Ser Ala Arg Arg Ser Ser Ser Phe Gln Ala Glu Val Ser
50 55 60
Leu Val
65

0210- 54
0211- 90
0212- DNA
0213- Human

0400- 54
gggggggac gggggggac gggggggggt gggggggggt gggggggggt gggggggggt gggggggggt
gggggggggt gggggggggt gggggggggt gggggggggt gggggggggt gggggggggt gggggggggt

0210- 55
0211- 114
0212- DNA
0213- Human

0400- 55
ggggggggac gggggggac gggggggggt gggggggggt gggggggggt gggggggggt gggggggggt 60
gggggggggt gggggggggt gggggggggt gggggggggt gggggggggt gggggggggt gggggggggt 114

0210- 56
0211- 11

<213> PFT
 <213> Artificial Sequence

<220>
 <220> carboxy terminus of modified GPCR

<400> 56
 Ala Ala Ala Arg Gly Arg Thr Pro Pro Ser Leu Gly Pro Gln Asp Glu
 1 5 10 15
 Ser Cys Thr Thr Ala Ser Ser Ser Leu Ala Lys Asp Thr Ser Ser
 20 25 30

<210> 57
 <211> 30
 <211> PFT
 <213> Artificial Sequence

<220>
 <220> carboxyl-terminal tail of V2R

<400> 57
 Cys Ala Arg Gly Arg Thr Pro Pro Ser Leu Gly Pro Gln Asp Glu Ser
 1 5 10 15
 Cys Thr Thr Ala Ser Ser Ser Leu Ala Lys Asp Thr Ser Ser
 20 25 30

<210> 58
 <211> 20
 <211> PFT
 <213> Artificial Sequence

<220>
 <220> V2R mutant receptor

<400> 58
 Cys Ala Arg Gly Arg Thr Pro Pro Ser Leu Gly Pro Gln Asp Glu Ser
 1 5 10 15
 Cys Thr Thr Ala
 20

<210> 59
 <211> 31
 <211> PFT
 <213> Artificial Sequence

<220>
 <220> V2R mutant receptor

<400> 59
 Cys Ala Arg Gly Arg Thr Pro Pro Ser Leu Gly Pro Gln Asp Glu Ser
 1 5 10 15
 Cys Thr Thr Ala Ala Ala Ala Leu Ala Lys Asp Ala Ala Ala
 20 25 30

<210> 61
 <211> 30
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> V2R mutant receptor

<400> 60
 Cys Ala Arg Gly Arg Thr Pro Pro Ser Leu Gly Pro Gln Asp Glu Ser
 1 5 10 15
 Cys Thr Thr Ala Ser Ser Ser Leu Ala Lys Asp Ala Ala Ala
 20 25 30

<210> 61
 <211> 30
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> V2R mutant receptor

<400> 61
 Cys Ala Arg Gly Arg Thr Pro Pro Ser Leu Gly Pro Gln Arg Glu Ser
 1 5 10 15
 Cys Thr Thr Ala Ala Ala Ala Leu Ala Lys Asp Thr Ser Ser
 20 25 30

<210> 62
 <211> 30
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> beta-2AR mutant receptor

<400> 62
 Cys Ala Arg Gly Arg Thr Pro Pro Ser Leu Gly Pro Gln Arg Glu Ser
 1 5 10 15
 Cys Thr Thr Ala Ala Ala Ala Leu Ala Lys Asp Thr Ser Ser
 20 25 30

<210> 63
 <211> 73
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> carboxyl-terminal tail of beta-2AR

<400> 63
 Cys Leu Arg Arg Ser Ser Leu Lys Ala Tyr Gly Asp Gly Tyr Ser Ser
 1 5 10 15

```

Asn Gly Asn Thr Gly Glu Gln Ser Gly Tyr His Val Glu Gln Glu Lys
    20                      25                      30
Glu Asn Lys Leu Leu Cys Glu Asp Leu Pro Gly Thr Glu Asp Phe Val
    35                      40                      45
Gly His Gln Gly Thr Val Pro Ser Asp Asn Ile Asp Ser Gln Gly Arg
    50                      55                      60
Asn Cys Ser Thr Asn Asp Ser Leu Leu
    65                      70

```

<110> 64
 <111> 63
 <112> PRT
 <113> Artificial Sequence

<120>
 <121> beta-2AR mutant receptor

```

<400> 64
Cys Leu Arg Arg Ser Ser Leu Lys Ala Tyr Gly Asn Gly Tyr Ser Ser
  1                      5                      10                      15
Asn Gly Asn Thr Gly Glu Gln Ser Gly Tyr His Val Glu Gln Glu Lys
    20                      25                      30
Glu Asn Lys Leu Leu Cys Glu Asp Leu Pro Gly Thr Glu Asp Phe Val
    35                      40                      45
Gly His Gln Gly Thr Val Pro Ser Asp Asn Ile Asp Ser Gln Gly Arg
    50                      55                      60
Asn Cys Ser Thr Asn Asp Ser Leu Leu Ser Ser Ser Leu Ala Lys Asp
    65                      70                      75                      80
Thr Ser Ser

```

<110> 65
 <111> 60
 <112> PRT
 <113> Artificial Sequence

<120>
 <121> beta-2AR mutant receptor

```

<400> 65
Cys Leu Arg Arg Ser Ser Leu Lys Ala Tyr Gly Asn Gly Tyr Ser Ser
  1                      5                      10                      15
Asn Gly Asn Thr Ser Ser Ser Leu Ala Lys Asp Thr Ser Ser
    20                      25                      30

```

<110> 66
 <111> 51
 <112> PRT
 <113> Artificial Sequence

<120>
 <121> carboxyl-terminal tail of V2R

<400> 66

```

Asn Pro Trp Ile Tyr Ala Ser Phe Ser Ser Ser Val Ser Ser Glu Leu
 1           5           10           15
Arg Ser Leu Leu Cys Cys Ala Arg Gly Arg Thr Pro Pro Ser Leu Gly
      20           25           30
Pro Gln Asp Glu Ser Cys Thr Thr Ala Ser Ser Ser Leu Ala Lys Asn
      35           40           45
Thr Ser Ser
      50

```

<210> 67
 <211> 51
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> receptor mutant

```

Asn Pro Trp Ile Tyr Ala Ser Phe Ser Ser Ser Val Ser Ser Glu Leu
 1           5           10           15
Arg Ser Leu Leu Cys Cys Ala Arg Gly Arg Thr Pro Pro Ser Leu Gly
      20           25           30
Pro Gln Asp Glu Ser Cys Thr Thr Ala Ser Ala Ala Ala Ala Lys Asn
      35           40           45
Thr Ser Ser
      50

```

<210> 68
 <211> 52
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> receptor mutant

```

Asn Pro Trp Ile Tyr Ala Ser Phe Ser Ser Ser Val Ser Ser Glu Leu
 1           5           10           15
Arg Ser Leu Leu Cys Cys Ala Arg Gly Arg Thr Pro Pro Ser Leu Gly
      20           25           30
Pro Gln Asp Glu Ser Cys Thr Thr Ala Ser Ser Ser Leu Ala Lys Asn
      35           40           45
Thr Ala Ala Ala
      50

```

<210> 69
 <211> 61
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> carboxyl-terminal tail : NTP-1

<211> 69

```

Asn Pro Ile Leu Tyr Asn Leu Val Ser Ala Asn Phe Arg Gln Val Phe
 1           5           10           15
Leu Ser Thr Leu Ala Cys Leu Cys Pro Gly Trp Arg His Arg Arg Lys
 20           25           30
Lys Arg Pro Thr Phe Ser Arg Lys Pro Asn Ser Met Ser Ser Asn His
 35           40           45
Ala Phe Ser Thr Ser Ala Thr Arg Glu Thr Leu Tyr
 50           55           60

```

<210> 70

<211> 60

<212> PRT

<213> Artificial Sequence

<220>

<223> receptor mutant

<400> 70

```

Asn Pro Ile Leu Tyr Asn Leu Val Ser Ala Asn Phe Arg Gln Val Phe
 1           5           10           15
Leu Ser Thr Leu Ala Cys Leu Cys Pro Gly Trp Arg His Arg Arg Lys
 20           25           30
Lys Arg Pro Thr Phe Ser Arg Lys Pro Asn Ser Ala Ser Ala Ala His
 35           40           45
Ala Phe Ser Thr Ser Ala Thr Arg Glu Thr Leu Tyr
 50           55           60

```

<210> 71

<211> 60

<212> PRT

<213> Artificial Sequence

<220>

<223> receptor mutant

<400> 71

```

Asn Pro Ile Leu Tyr Asn Leu Val Ser Ala Asn Phe Arg Gln Val Phe
 1           5           10           15
Leu Ser Thr Leu Ala Cys Leu Cys Pro Gly Trp Arg His Arg Arg Lys
 20           25           30
Lys Arg Pro Thr Phe Ser Arg Lys Pro Asn Ser Met Ser Ser Asn His
 35           40           45
Ala Phe Ser Ala Ala Ala Thr Arg His Thr Leu Tyr
 50           55           60

```

<210> 72

<211> 65

<212> PRT

<213> Artificial Sequence

<220>

<223> carboxyl-terminal tail of GTR

<400> 72

```

Asn Pro Trp Ile Tyr Met Leu Phe Thr Gly His Leu Phe His Ala Leu
1      5      10      15
Val Gln Arg Phe Leu Cys Cys Ser Ala Ser Tyr Leu Lys Gly Arg Arg
20      25      30
Leu Gly Glu Thr Ser Ala Ser Lys Lys Ser Asn Ser Ser Ser Phe Val
35      40      45
Leu Ser His Arg Ser Ser Ser Gln Arg Ser Cys Ser Gln Pro Ser Thr
50      55      60
Ala
65

```

4110: 73
 4111: 65
 4112: PRT
 4113: Artificial Sequence

4220:
 4223: receptor mutant

```

4400: 73
Asn Pro Trp Ile Tyr Met Leu Phe Thr Gly His Leu Phe His Ala Leu
1      5      10      15
Val Gln Arg Phe Leu Cys Cys Ser Ala Ser Tyr Leu Lys Gly Arg Ala
20      25      30
Ala Ala Ala Thr Ser Ala Ser Lys Lys Ser Asn Ser Ser Ser Phe Val
35      40      45
Leu Ser His Arg Ser Ser Ser Gln Arg Ser Cys Ser Gln Pro Ser Thr
50      55      60
Ala
65

```

4110: 74
 4111: 65
 4112: PRT
 4113: Artificial Sequence

4220:
 4223: receptor mutant

```

4400: 74
Asn Pro Trp Ile Tyr Met Leu Phe Thr Gly His Leu Phe His Ala Leu
1      5      10      15
Val Gln Arg Phe Leu Cys Cys Ser Ala Ser Tyr Leu Lys Gly Arg Ala
20      25      30
Leu Gly Glu Thr Ser Ala Ala Ala Ala Ser Asn Ser Ser Ser Phe Val
35      40      45
Leu Ser His Arg Ser Ser Ser Gln Arg Ser Cys Ser Gln Pro Ser Thr
50      55      60
Ala
65

```

4110: 75
 4111: 65
 4112: PRT

<213> Artificial Sequence

<220>

<223> receptor mutant

<400> 75

```

Asn Pro Trp Ile Tyr Met Leu Phe Thr Gly His Leu Phe His Glu Leu
 1             5             10             15
Val Gln Arg Phe Leu Cys Cys Ser Ala Ser Tyr Leu Lys Gly Arg Arg
      20             25             30
Leu Gly Glu Thr Ser Ala Ser Lys Lys Ser Asn Ser Ser Ser Phe Val
      35             40             45
Leu Ser His Arg Ala Ala Ala Gln Arg Ser Cys Ser Gln Pro Ser Thr
      50             55             60
Ala
65

```

<210> 76

<211> 105

<212> PRT

<213> Artificial Sequence

<220>

<223> carboxyl-terminal tail of SPR

<400> 76

```

Asn Pro Ile Ile Tyr Cys Cys Leu Asn Asp Arg Phe Arg Leu Gly Phe
 1             5             10             15
Lys His Ala Phe Arg Cys Cys Pro Phe Ile Ser Ala Gly Asp Tyr Glu
      20             25             30
Gly Leu Glu Met Lys Ser Thr Arg Tyr Leu Gln Thr Gln Gly Val Tyr
      35             40             45
Lys Val Ser Arg Leu Glu Thr Thr Ile Ser Thr Val Val Gly Ala His
      50             55             60
Glu Glu Glu Pro Glu Gly Pro Lys Ala Thr Pro Ser Ser Leu Lys Leu
      65             70             75             80
Thr Ser Asn Cys Ser Ser Arg Ser Asp Ser Lys Thr Met Thr Lys Ser
      85             90             95
Phe Ser Phe Ser Ser Asn Val Leu Ser
      100             105

```

<210> 77

<211> 86

<212> PRT

<213> Artificial Sequence

<220>

<223> receptor mutant

<400> 77

```

Asn Pro Ile Ile Tyr Cys Cys Leu Asn Asp Arg Phe Arg Leu Gly Phe
 1             5             10             15
Lys His Ala Phe Arg Cys Cys Pro Phe Ile Ser Ala Gly Asp Tyr Glu
      20             25             30
Gly Leu Glu Met Lys Ser Thr Arg Tyr Leu Gln Thr Gln Gly Val Tyr

```

Lys Val Ser Arg Leu Glu Thr Thr Ile Ser Thr Val Val Gly Ala His
50 55 60
Glu Glu
65

#210: 78
 #211: 44
 #212: PERT
 #213: Artificial Sequence

0223 receptor mutant

4000 75
Asn Pro Ile Ile Tyr Cys Cys Leu Asn Asp Arg Phe Arg Leu Gly Phe
1 3 10 15
Lys His Ala Phe Arg Cys Cys Pro Phe Ile Ser Ala Gly Asp Tyr Glu
20 25 30
Gly Leu Glu Met Lys Ser Thr Arg Tyr Leu Gln Thr
35 40

```

>210> 79
>211> 20
>212> PPT
>213> Artificial Sequence

```

<220>
<223> receptor mutant

```

14000: 79
Asn Pro Ile Ile Tyr Cys Cys Leu Asn Asp Arg Phe Arg Leu Gly Phe
      5              10              15
Lys His Ala Thr
      20

```

- 111: 7C
- 111: 8C
- 111: PBT
- 110: Artificial Sequence

4.003 - receptor mutant

```

14000-20
Asn Pro Ile Ile Tyr Cys Cys Leu Asn Asp Arg Phe Arg Leu Gly Phe
  1             5             10             15
Lys His Ala Phe Arg Cys Cys Pro Phe Ile Ser Ala Gly Asp Tyr Glu
          20             25             30
Gly Leu Glu Met Lys Ser Thr Arg Tyr Leu Gln Thr Ala Ala Val Ala
      35             40             45
Ala Val Ser Arg Leu Glu Thr Thr Ile Ser Thr Val Val Gly Ala His
      50             55             60
Glu Glu Glu Pro Glu

```


65

-2210> 81

-2211> 68

-2212> PRT

-2213> Artificial Sequence

-2220>

-2223> receptor mutant

-400> 81

Asn	Pro	Ile	Ile	Tyr	Cys	Cys	Leu	Asn	Asp	Arg	Phe	Arg	Leu	Gly	Phe
1				5					10					15	
Lys	His	Ala	Phe	Arg	Cys	Cys	Pro	Phe	Ile	Ser	Ala	Gly	Asp	Tyr	His
		20						25					30		
Gly	Leu	Glu	Met	Lys	Ser	Thr	Arg	Tyr	Leu	Gln	Thr	Gln	Gly	Val	Tyr
		35					40					45			
Lys	Val	Ser	Arg	Leu	Glu	Thr	Thr	Ile	Ser	Thr	Val	Ala	Gly	Ala	Ala
	50					55					60				
Glu	Glu	Glu	Pro												
65															